
FRBSF WEEKLY LETTER

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1989 Fall Academic Conference

The Federal Reserve Bank of San Francisco hosts a Fall Academic Conference to bring together academic and Federal Reserve economists working in areas of common interest. At the most recent conference, held on November 30 and December 1, 1989, papers were presented on the role of risk in bank behavior, the influence of information asymmetries on the real economy, and the role of supply-side factors in business cycles. This *Letter* summarizes these papers. Copies of the papers are available from the Economic Research Department of the Federal Reserve Bank of San Francisco.

Bank risk

Each of the three banking papers presented at the Conference focuses on the assessment of bank risk. A paper by J. Kimball Dietrich of the University of Southern California, "Bank Balance Sheet Composition and Stock Market Return Sensitivity to Macroeconomic Risk Factors," examines the effect of macroeconomic "risk factors" on bank stock returns. Dietrich studies two separate periods: one prior to deposit rate deregulation (1973 to 1977) and the other covering the period in which deposit rates were deregulated (1978 to 1983). He finds that in both periods term-structure risk and default risk significantly influenced the riskiness of bank stocks. But he also finds that the volatility of overall industrial activity affected substantially more of the subject bank stocks in the later period than in the earlier period.

Dietrich also estimates the effect of balance sheet composition on the sensitivity of bank stock returns to the various macroeconomic risk factors. He finds that the stock returns of banks with a higher proportion of demand deposits to total equity tend to fall less than others' when there is unexpected inflation. A possible explanation for this result is that since demand deposits pay no interest, banks with a high proportion of this type of funding experience a smaller increase in liability costs when nominal interest rates rise.

In addition, Dietrich demonstrates that larger holdings of cash and reserves tend to increase bank sensitivity to unexpected inflation risks. On the whole, though, differences in asset and liability composition do not seem to explain much of the variation in the sensitivity of bank stocks to macroeconomic risk factors. This suggests that regulators must look beyond overall balance sheet composition to monitor bank risk effectively.

A second banking paper, "A Framework for Assessing Depository Institution Risk," by Robert S. Chirinko of the University of Chicago and Gene D. Guill of Bankers Trust, moves in this direction. Chirinko and Guill look within a bank's loan portfolio to see how its make-up affects the probability of substantial loan losses.

Chirinko and Guill find that loan loss risk depends very much on the particular distribution of loans within the bank's portfolio and on the particular macroeconomic environment. For example, assuming a relatively expansionary macroeconomic environment, they find that the *risk-based* deposit insurance premium for a bank with a portfolio heavily weighted toward energy-related lines of business should be approximately 87 percent higher than for the "average" bank in the sample.

For all of the simulated portfolios they examine, there seems to be significant positive correlation between conditions in different industries that must be taken into account when making risk assessments. Thus, they find that ignoring correlations among returns on loans in the portfolio can substantially understate risk exposure. This finding suggests that the benefits of diversification are not always obtained simply by expanding the number of industries represented in a portfolio.

A third banking paper was by Gary Gorton and George Pennacchi of the University of Pennsylvania, entitled "Banks and Loan Sales: Evidence

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of Implicit Contracts." According to a widely accepted theory of financial intermediation, loan sales create an incentive problem in that a bank may not take as much care in evaluating a loan it intends to sell as it does in evaluating a loan it intends to hold. Although potential loan buyers recognize this incentive problem, they do not have access to the information needed to independently determine the riskiness of the loans offered for sale, and therefore will purchase such loans only at steep discounts. The puzzle, then, is why loan sales occur and how a bank can profit from this activity.

Gorton and Pennacchi attempt to solve this puzzle by looking for empirical evidence of "implicit guarantees" in loan sales contracts. Such a guarantee might be in the form of an implicit agreement by the selling bank to repurchase the loan should it go sour. By providing recourse, an implicit guarantee eliminates the incentive problem inherent in loan sales and enhances the market value of the loan when sold.

Gorton's and Pennacchi's statistical examination of about 870 loan sales from a single large bank yielded no convincing evidence of implicit guarantees in loan sales contracts. One explanation for this result is that such guarantees are present, but it is simply too difficult to detect them in the absence of explicit contractual agreements. Alternatively, of course, it may be that the implicit model of bank behavior needs to be modified.

Asymmetric information

Another set of papers examines how information asymmetries among financial market participants can affect the financing of investment projects and ultimately real macroeconomic activity.

"Macroeconomic Models with Equity and Credit Rationing," by Bruce Greenwald of Bellcore, Joseph Stiglitz of Stanford University, and Andrew Weiss of Boston University, shows that equity issuance will be limited, and bank credit will be rationed when the owners of a firm have more information about the profitability of the firm's projects than do outside investors and bank lenders.

As a consequence, financial market conditions can have a major impact on firms' real investment and output decisions. This connection between the financial and real sectors suggests that monetary policy may affect the real economy more by influencing the supply of credit

than by influencing interest rates. By increasing the supply of credit available for bank lending, an increase in the money supply mitigates the credit short-fall for firms with sound investment projects.

In "AIL Theory and Ailing Phillips Curve: A Contract-Based Approach to Aggregate Supply," Roger Farmer of the University of California at Los Angeles suggests that information asymmetries provide an explanation for recent instability in the Phillips curve, which historically has embodied a negative relationship between wage inflation and unemployment. However, many economists have observed that beginning in the 1970s, low aggregate output (and high unemployment) has been associated at times with high inflation. Economists who believe that there is a systematic short-run trade-off between output and inflation have argued that this apparent instability can be attributed to changing inflation expectations and/or changes in the relative prices of important inputs to production, such as oil.

In Farmer's framework, firms face imperfect financial markets in which borrowers have more information than lenders, and borrowers have limited collateral. Farmer shows that these market imperfections induce banks to restrict the supply of loans when real interest rates are high, making the availability of internally-generated financing a key determinant of the levels of investment and output during high interest rate periods. Moreover, Farmer's model posits that the level of nominal interest rates will influence the levels of employment and output because firms must pay their workers in cash, and the nominal interest rate is the opportunity cost of firms' cash holdings.

Farmer finds, then, that the Phillips curve relationship remains stable over pre- and post-war periods when these variables—nominal interest rates and business profits—are included in econometric tests.

In "Developing Country Borrowing and Domestic Wealth," Mark Gertler of the University of Wisconsin and Kenneth Rogoff of the University of California at Berkeley examine the implications of informational asymmetry between international lenders and developing country debtors. Their model assumes that borrowers can use their domestic wealth and loan proceeds either for domestic investment or for investments

in riskless assets abroad, with lenders lacking knowledge of the actual decision made by the borrower. This creates an incentive problem, leading to restrictions in the supply of credit. Consequently, the marginal return on investment will exceed the marginal cost of capital at the level of investment actually undertaken in the borrowing countries.

Thus, differences in cross country marginal products of capital can persist even when the international capital market is highly integrated because of differences in the costs of internal and external financing of investment. In addition, the higher a country's net wealth, the higher should be its level of investment and its ability to borrow.

Real business cycles

Real business cycle theories attribute most aggregate macroeconomic fluctuations to technology shocks, rather than to changes in monetary conditions or fiscal spending behavior. Two papers at the conference examine the ability of such models to explain particular macroeconomic phenomena.

Using a real business cycle model, Thomas Cooley of the University of Rochester and Gary Hansen of the University of California at Los Angeles offer a rationale for inflationary monetary policies in their paper, "Some Welfare Costs of Monetary and Fiscal Policy." Although most policy makers would agree that inflation has negative welfare and incentive effects, inflation of varying degrees still is observed across nearly all countries. Cooley and Hansen suggest that the costs of inflation notwithstanding, governments may have an incentive to engage in inflationary policies. For by reducing the real purchasing power of money, inflation acts as a tax directly levied on money holders and collected by the government.

This still leaves the question whether an inflation tax is preferable to alternative forms of taxation. Cooley and Hansen model inflation as an indirect consumption tax levied on goods that can be purchased only with cash. They then compare both the efficiency implications and the adverse welfare effects of using this inflation tax as a source of revenue with those of direct capital and income taxes as sources of revenue. They

find the distortionary effects of the inflation tax to be no worse than other taxes. In terms of the revenues raised, the inflation tax is superior.

However, their framework likely understates the adverse effects of inflation because it assumes perfect information and flexible prices. These assumptions ignore the effects of inflation on price level uncertainty and multi-period contractual arrangements, both of which can add significantly to the costs of inflation.

In "Real Business Cycles and the Test of the Adelmans," Robert King and Charles Plosser of the University of Rochester assess the ability of real business cycle models to mimic the observed characteristics of past U.S. business cycles. During the 1940s and 1950s economists Wesley Mitchell and Arthur Burns at the National Bureau of Economic Research attempted to measure the empirical regularities observed over U.S. business cycles in a systematic fashion. Their measures have provided a benchmark for testing the ability of models of the macroeconomy to explain business cycle movements.

In a 1959 study, Irma and Frank Adelman found that the Keynesian structural model developed by Klein and Goldberger generated a business cycle with properties similar to the measures constructed by Mitchell and Burns. They interpreted this result to imply that the Klein-Goldberger model provided a good explanation of U.S. economic activity.

King and Plosser carry out a similar exercise using a real business cycle model. They find that the business cycle properties of their model are also indistinguishable from the Mitchell-Burns measures. Given that their model and the Klein-Goldberger model both pass the Mitchell-Burns "test," despite drastically different theoretical orientations, King and Plosser express concerns about the power of the Mitchell-Burns measures to distinguish among models of the U.S. economy.

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